

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-71 are presently pending in this application, Claims 12-71 having been withdrawn from further consideration by the Examiner.

In the outstanding Office Action, Claims 1, 2, 6-8, 10 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bhatt et al. (U.S. Patent 5,822,856) in view of Kanber (U.S. Patent 5,312,765); Claims 3 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bhatt et al., Kanber in view of Lee et al. (U.S. Patent 5,452,283); Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Bhatt et al., Kanber in view of Stone (U.S. Patent 5,530,288); and Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Bhatt et al., Kanber in view of Lee et al. and Stone.

Before addressing the rejections based on the cited references, a brief review of Claim 1 is believed to be helpful. Claim 1 is directed to a substrate for mounting an IC chip and recites: “an insulating substrate having a first surface and a second surface on an opposite side of the first surface; a first built-up structure formed on the first surface of the insulating substrate and comprising a conductor circuit and an interlaminar insulating layer; a second built-up structure formed on the second surface of the insulating substrate and comprising a conductor circuit and an interlaminar insulating layer; a solder resist layer formed as an outermost layer over the first built-up structure; an optical element mounted over the solder resist layer; and an optical path for transmitting optical signal to or from the optical element and penetrating through the insulating substrate, first built-up structure, second built-up structure and solder resist layer.”

The Office Action states that the structure recited in Claim 1 is unpatentable over Bhatt et al. and Kanber because “[i]t would have been obvious ... to replace Bhatt’s structure

with Kanber's structure as suggested above to improve the heat dissipation efficiency and make string substrate (col. 2, lines 38-41)" In reaching this conclusion, the Office Action states that "Bhatt does not explicitly disclose the element is an **optical** element; the path is an **optical** path for transmitting optical signal to or from the **optical** element" and that "Kanber discloses the element is an optical element 76, 84 (Fig. 12, col. 6, lines 21-22, col. 3, lines 49-50); the path is an optical path 92 (Fig. 12, col. 6, lines 38-41) for transmitting optical signal 94 to or from the optical element 76, 84." Applicants respectfully traverse the combination of Bhatt et al. and Kanber as advanced in the Office Action based on the following discussions.

It is respectfully submitted that "[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification."¹ MPEP also states that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."²

Bhatt et al. is clear in its summary of invention that the plated through holes are filled with an organic based conductive material possibly together with thermoconductive dielectric particles for better thermal performance or with electroconductive particles to provide conductive holes.³ On the contrary, Kanber states that "optoelectronic devices are formed on a first surface of substrate using ion implantation"⁴ and that "[h]ollow vias 92 may be formed through the substrate 10 to enable an optical pattern to be incident on the devices 16"⁵ In other words, Bhatt et al. describes filling a hollow portion of a plated through hole with an

¹ *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

² *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

³ See, for example, Bhatt et al., column 2, lines 28-43.

⁴ Kanber, column 2, lines 7-8.

⁵ *Id.*, column 6, lines 38-40.

organic based conductive material, whereas Kanber describes an optoelectronic device integrally formed in a semiconductor substrate using a portion of the semiconductor substrate and a hollow via formed through the substrate for the optoelectronic device. As such it is believed that the combination of the structures in Bhatt et al. and Kanber as proposed in the Office Action would change the principle of operation described in both Bhatt et al. and Kanber and also render the Bhatt et al. and Kanber structures unsatisfactory for their disclosed intended purposes. As such, it is believed that the combination proposed in the Office Action is a product of hindsight guided by Applicants' disclosure and lacks a proper motivation.

Based on the foregoing discussions, it is respectfully submitted that the structure recited in amended Claim 1 is distinguishable from Bhatt et al. and Kanber, and Applicants respectfully request that the outstanding obviousness rejection based on Bhatt et al. and Kanber be withdrawn.


In addition, because neither Lee et al. nor Stone is believed to teach or suggest "an optical path for transmitting optical signal to or from the optical element and penetrating through the insulating substrate, first built-up structure, second built-up structure and solder resist layer" as recited in Claim 1, the teachings of Bhatt et al., Kanber, Lee et al. and Stone even in combination are not believed to render the structure recited in Claim 1 obvious.

For the foregoing reasons, Claim 1 is believed to be allowable. Furthermore, since Claims 2-11 depend directly or indirectly from Claim 1, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 2-11 are believed to be allowable as well.

In view of the discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Akihiro Yamazaki', is written over a horizontal line.

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